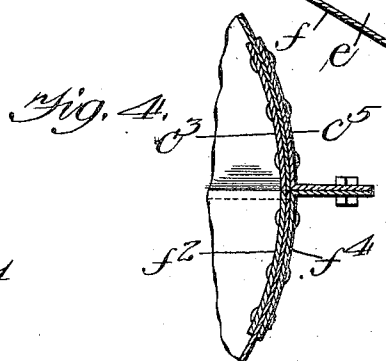
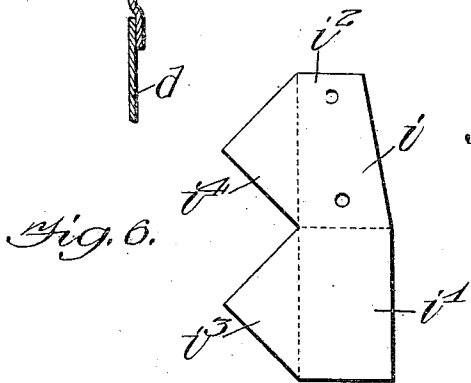
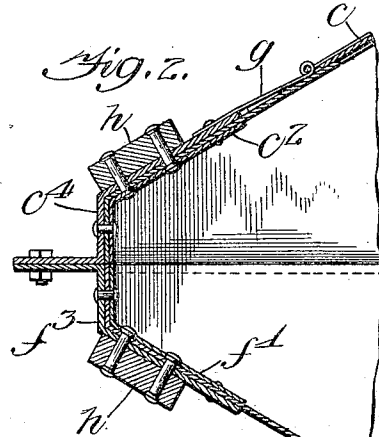
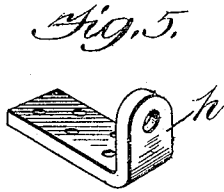
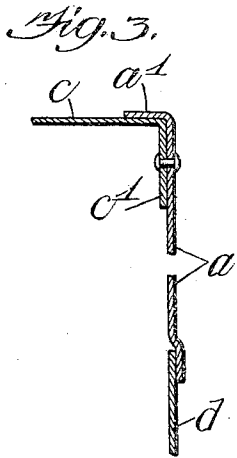
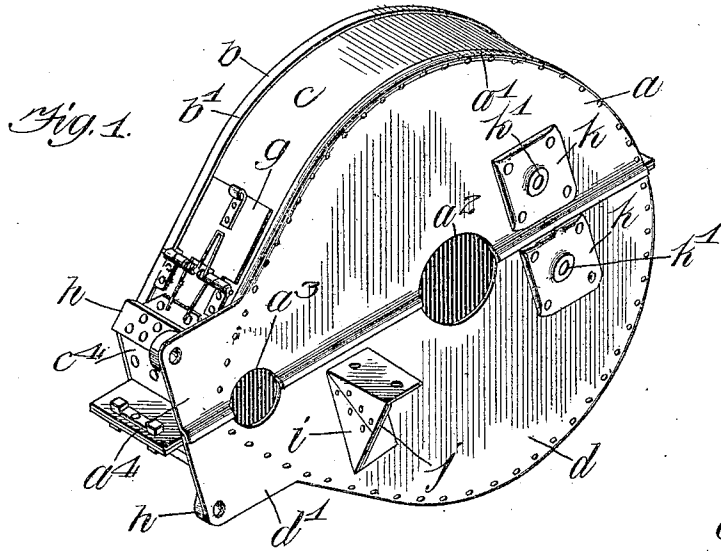


B. L. WATERS.
GEAR CASE.

APPLICATION FILED FEB. 19, 1906.



Witnesses:
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UNITED STATES PATENT OFFICE.

BEVERLY L. WATERS, OF CHICAGO, ILLINOIS.

GEAR-CASE.

No. 838,598.

Specification of Letters Patent.

Patented Dec. 18, 1906.

Application filed February 19, 1906. Serial No. 301,852.

To all whom it may concern:

Be it known that I, BEVERLY L. WATERS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Gear-Cases, of which the following is a specification.

My invention relates to gear-cases, especially for the reduction-gears in electric-railway work, and it is in some respects like the case for which patent was granted to me May 9, 1905, No. 789,306.

The main object of the invention is to provide a simple and effective construction for rendering the case strong and durable and readily secured to the car-trucks in such manner that the case cannot be shaken loose by the jarring of the trucks upon the track.

Another object of the invention is to provide a form of building-up bracket which will not only support and reinforce the side of the case, but will be light in weight, rigid, and constructed of but two simple parts.

I attain my objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a general perspective view of the case. Fig. 2 is a vertical sectional view of the smaller end thereof. Fig. 3 is a fragmentary view in section, showing the preferred manner of attaching the sides to the top and bottom of the case. Fig. 4 is a fragmentary vertical sectional view of the case at the larger end thereof, showing the reinforcing-pieces and flange by which the upper and lower halves are bolted together. Fig. 5 is a perspective view of one of the lugs at the smaller end of the case. Fig. 6 is a development of one of the bracket-pieces.

Similar letters refer to similar parts throughout the several views.

The casing is made of sheet metal and formed in halves in order that it may be readily fitted over the reduction-gears. The upper half of the case consists of the two side sheets *a* and *b*, which are riveted to the top pieces *c*, preferably in the manner shown in sections in Figs. 2 and 3, the top sheet *c* having a depending flange *c'* adapted to lie adjacent to the inner surface of the side sheets and adapted to receive a row of riveting, as shown. The side sheets *a* and *b* have inwardly-extending flanges *a'* and *b'*, which lie adjacent to the top surfaces of the top sheet *c*. The bottom half of the case is formed in a similar

manner, having the side sheets *d* and *e* and the bottom *f*.

It is desirable that the lower edge of sheet *a* be offset, as shown in Figs. 1 and 3, so as to fit over the upper edge of the lower half of the case and render the same dustproof as near as may be and at the same time assist in holding the parts in proper relation with each other.

It is desirable that the case conform in outline approximately to the shape of the two gears, and with this purpose in view one end of the case is circular in outline and concentric about the aperture *a²* in the side of the case which is designed to receive the axle of the larger gear-wheel. At the opposite end of the case, where it has the aperture *a³* for the smaller gear-shaft, the top and bottom of the case converge, making this end of the case smaller than the other.

In order to impart great stiffness and rigidity to the case, it is desirable to place reinforcing-plates *c²* and *f²* inside of the case at the smaller end thereof and similar plates *c³* and *f³* inside of the case at the larger end thereof. For the double purpose of further strengthening the case and affording means for securing the upper half to the lower half when the parts are in position are pieces *c⁴* and *f⁴* at the smaller end of the case and *c⁵* and *f⁵* at the larger end, these pieces having horizontal flanges adapted to be bolted together, as shown. In the top of the case, preferably near the smaller end thereof, is provided a door *g*, through which the gears may be oiled and inspected.

The side sheets *a* and *d* instead of conforming completely to the outline of the case have extensions *a⁴* and *d⁴*, respectively, at the smaller end of the case, said extensions being integral with said sheets *a* and *d* and projecting a distance great enough to receive a bolt or similar fastening device, which may penetrate said extensions without penetrating the body of the case. Said projections are suitably apertured to receive such bolts or fastening devices, whereby the case may be secured to a convenient portion of the car-trucks. These extensions or projections *a⁴* and *d⁴* are stiffened and the whole case braced by means of the L-shaped lugs *h h*, one on the upper half of the case and one on the lower half. One leg of each of these lugs is riveted to the top or bottom of the case, near the smaller end thereof, while the other leg lies adjacent

to the extension a^4 and d' , as the case may be. The last-mentioned leg of each lug is apertured in such manner as to register with the aperture in the projections a^4 and d' . It will

5 thus be seen that when a bolt passes through said projections and lugs and is screwed tight not only will the projections and the lug reinforce each other, but the whole case will be rigidly and securely fastened to the car-truck. A rigid fastening is of extreme importance in work of this class, for the jar on the railway-trucks is exceedingly great and will loosen and break down gear-cases unless the same are of great strength and durability.

15 On the side of the lower half of the case, preferably on sheet d , is a supporting-bracket, which in the present instance consists of two pieces i and j . The piece i is shown flat in Fig. 6 and as there shown is adapted to be bent up in such manner that the portion i^1 thereof shall lie flat against the side sheet d , the portion i^2 shall lie horizontal and at right angles to sheet d , and portions i^3 and i^4 shall lie in a vertical direction at right angles both to sheet d and to the top of the bracket. The edges of portions i^3 and i^4 are adapted to be brought together and there riveted to the plate j , which fits within the outer shell as formed and serves to preserve its shape under the conditions of jar and pressure to which the case is subjected in actual use.

It may be necessary to provide, in addition to the above-described attaching means, the flat lugs k k , riveted to side sheets a and d and having threaded bosses k' k' for receiving stud-bolts or similar devices for assisting in fastening the case to the car-trucks.

What I claim as new, and desire to secure by Letters Patent, is—

40 1. A gear-case, one side of which is composed of substantially flat sheets of metal which project beyond the outlines of the case and thereby afford means through which a bolt or similar fastening device may penetrate without penetrating the body of the case, the said projecting part of the sheet lying in the same plane as the remainder.

50 2. A gear-case formed in halves, the sides being parallel and the top and bottom pieces being disposed at right angles thereto and composed of sheet metal riveted together, one end of said case being smaller than the other, and the top and bottom pieces converging, the sheet metal at one side project-

ing beyond the outline of the case at the small end thereof for facilitating and increasing the security of attachment to an exterior support.

3. A gear-case having one side made of sheet metal which projects at some point beyond the outline of the case and an L-shaped lug having one leg secured to the body of the case and the other leg adjacent to the projecting portion of the extended side, whereby a bolt or similar fastening device may penetrate the leg and sheet without penetrating the body of the case.

4. A sheet-metal gear-case having parallel sides, and a top and bottom riveted thereto, one side of said case projecting beyond the outline of the case; and an L-shaped lug having one leg secured to the top of the case and the other leg adjacent to the projecting portion of the side sheet for the purpose described.

5. A gear-case formed in halves, the sides being parallel and the top and bottom pieces being disposed at right angles thereto and composed of sheet metal riveted together, one end of said case being approximately circular in outline and the other end being smaller with the top and bottom pieces converging one of the side sheets of one of the halves projecting beyond the end of the case and having one leg of a bent lug adjacent thereto the other leg of said lug being secured to the body of the case.

6. A gear-case formed in halves and having parallel sheet-metal sides; in combination with a supporting-bracket rigidly attached to one-half of the case for supporting the same, said bracket having a broad flat surface adjacent to the side of the case for stiffening and bracing the same, and said bracket consisting of a sheet of metal bent up so as to have one surface adjacent to the side of the case and another surface perpendicular thereto and two flanges meeting along their edges and perpendicular to the side and top, and a plate riveted to the said flanges for holding the same in position.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

BEVERLY L. WATERS.

Witnesses:

G. VEISEY,
DWIGHT B. CHEEVER.